

**UNITED STATES PATENT APPLICATION**

**OF**

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**FOR**

**WASHING MACHINE**

[0001] This application claims the benefit of Korean Application(s) No. 10-2002-0075016 filed on November 28, 2002 which is/are hereby incorporated by reference.

## BACKGROUND OF THE INVENTION

### 5 Field of the Invention

[0002] The present invention relates to a washing machine of which detergent box is simply installed at a top plate side.

### Discussion of the Related Art

[0003] Generally, a washing machine is an apparatus for washing, rinsing, and  
10 dewatering laundry held in a drum using reaction between water and detergent supplied to a tub.

[0004] A detergent box is provided to a top plate forming a topside of a washing machine according to a related art. Water supplied externally is mixed with detergent when passing through the detergent box. And, the water mixed with the detergent is supplied to the  
15 tub.

[0005] The drum provided inside the tub then rotates to generate a current to wash the laundry.

[0006] However, the related art washing machine has the following problems or disadvantages.

[0007] First of all, the detergent box is coupled to the top plate using coupling  
20 members such as screws, etc. Holes formed at the detergent box and the top plate are aligned to each other, and the screws are then inserted in the corresponding holes. Thus, it is uneasy to assemble the detergent box as well as it takes so much time to assemble the detergent box.

## SUMMARY OF THE INVENTION

[0008] Accordingly, the present invention is directed to a washing machine that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

5 [0009] An object of the present invention, which has been devised to solve the foregoing problem, lies in providing a washing machine, by which a detergent box is assembled simply and quickly.

[0010] Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent to those having ordinary skill in the art upon examination of the following or may be learned from a practice of the invention. The  
10 objectives and other advantages of the invention will be realized and attained by the subject matter particularly pointed out in the specification and claims hereof as well as in the appended drawings.

[0011] To achieve these objects and other advantages in accordance with the present  
15 invention, as embodied and broadly described herein, there is provided a washing machine including a cabinet, a tub, a drum, and a detergent box assembly including a top plate provided on the cabinet and having an opening at one side, a detergent box provided to the opening and having a plurality of first bosses protruding upward to hold screws, respectively, and a cover frame provided to a topside of the detergent box and having a plurality of second  
20 bosses protruding downward to hold the screws, respectively.

[0012] In this case, one end of the second boss is inserted in an upper portion of the corresponding first boss. And, an interior screw is formed in a lower portion of each of the first bosses to be coupled to the corresponding screw. Moreover, a bend part bent downward is further provided to an edge of the opening.

[0013] Meanwhile, a plurality of hooks are formed at both sides of the detergent box and a plurality of holes are formed at the bent part to be coupled to the hooks, respectively, and a plurality of the hooks and the holes are formed in front and rear sides of the detergent box. Moreover, a cover for covering the detergent box is rotatably installed at one side of the  
5 cover frame.

[0014] In another aspect of the present invention, there is provided a washing machine including a cabinet, a tub, a drum, and a detergent box assembly including a top plate provided on the cabinet and having an opening at one side, a detergent box loaded on the opening to be hung by a hanging means, a cover frame having a rim loaded on an upper  
10 surface of a neighbour part of the opening, and a bent part bent downward from an edge of the opening.

[0015] In this case, the hanging means includes a plurality of hooks protruding from sides of the detergent box and a plurality of holes formed at the bent part to have the hooks inserted therein, respectively.

[0016] Moreover, the washing machine further includes a plurality of first bosses protruding upward from an upper surface of the detergent box to hold screws, respectively and a plurality of second bosses protruding downward from a lower surface of the cover frame to hold the screws, respectively. In this case, one end of the second boss is inserted in an upper portion of the corresponding first boss and an interior screw is formed in a lower  
15 portion of each of the first bosses to be coupled to the corresponding screw. Moreover, the  
20 neighbour part of the opening is clamped between the detergent box and the cover frame.

[0017] Besides, a cover for covering the detergent box is rotatably installed at one side of the cover frame. And, a plurality of storing parts for storing detergent are formed in the detergent box.

[0018] It is to be understood that both the foregoing explanation and the following detailed description of the present invention are exemplary and illustrative and are intended to provide further explanation of the invention as claimed.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

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[0020] FIG. 1 is a perspective view of a washing machine according to the present invention;

[0021] FIG. 2 is a cross-sectional view of a washing machine according to the present invention;

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[0022] FIG. 3 is a perspective view of an assembly of a detergent box and a cover frame according to the present invention;

[0023] FIG. 4 is a perspective view of a detergent box loaded on a top plate according to the present invention;

[0024] FIG. 5 is a perspective view of a cover frame installed on a top plate according to the present invention; and

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[0025] FIG. 6 is a cross-sectional view of first and second bosses in FIG. 3.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

[0026] Reference will now be made in detail to the preferred embodiment(s) of the present invention, examples of which are illustrated in the accompanying drawings.

Throughout the drawings, like elements are indicated using the same or similar reference designations where possible.

[0027] FIG. 1 is a perspective view of a washing machine according to one embodiment of the present invention and FIG. 2 is a cross-sectional view of a washing machine according to one embodiment of the present invention.

[0028] Referring to FIG. 1 and FIG. 2, a washing machine according to the present invention includes a case 2, a tub 6, a drum 8, and a driving motor (not shown in the drawing).

[0029] The case 2 forms an exterior of the washing machine, and a door 4, via which a laundry is inputted/outputted, is provided to a front side of the case 2. The tub 6 is provided in the case 2 to hold water and detergent. The cylindrical drum 8 is provided in the tub 6. The drum 8 holds laundry and is rotated by the driving motor. In doing so, the laundry is washed by the friction between the laundry and current.

[0030] A multitude of holes 9 are formed at a circumference of the drum 8, and the water communicates between the tub 6 and the drum 8 to generate the current.

[0031] Meanwhile, the case 2 includes a cabinet 10, a front panel 12, a top plate 16, and a base 18.

[0032] The front panel 12 is provided to a front side of the cabinet 10, and an opening 12a is formed at a central part of the front panel 12. Moreover, a door 4 is rotatably installed in the vicinity of the opening 12a.

[0033] The top plate 16 is provided over the cabinet 10, and a control panel 14 for controlling an operation of the washing machine is provided to a rear part of an upper surface of the top plate 16. And, the base 18 is provided under the cabinet 10 to support a bottom of the washing machine.

[0034] An inlet hose 20 for supplying water is provided under the top plate 16. The

inlet hose 20 is connected to a detergent box 24 provided to one side of a front part of the top plate 16. The water supplied via the inlet hose 20 passes through the detergent box 24 to be mixed with detergent. The water mixed with the detergent is led to the tub 6 via an inlet bellows 26.

5        [0035]     Meanwhile, a plurality of storing parts for storing the detergent are formed inside the detergent box 24. And, a cover 30 is provided to a topside of the detergent box 24 to open/close the storing parts 23. The cover 30 is rotatably fixed to a cover frame 40 that is assembled to the detergent box 24. In this case, the cover 30 is coupled to the cover frame 40 using a hinge.

10       [0036]     An operation of the washing machine according to the present invention is explained as follows.

         [0037]     First of all, after the detergent is put in the storing parts 23, the cover 30 is revolved to cover topsides of the storing parts 23. The laundry is put in the drum 8, and the washing machine is then driven so that water flows in the detergent box 24. The water passes  
15       through the storing parts 23 to be mixed with the detergent. The water mixed with the detergent then flows in the tub 6 via the inlet bellows 26. Once the water mixed with the detergent fills the tub 6 with an appropriate amount, the laundry is soaked in the water.

         [0038]     Subsequently, the driving motor rotates the drum 8 so that the dirt or filth attached to the laundry undergoes friction with the water and detergent to be separated from  
20       the laundry. After completion of washing, rinsing and dewatering are executed in turn.

         [0039]     FIG. 3 is a perspective view of an assembly of a detergent box and a cover frame according to another embodiment of the present invention, FIG. 4 is a perspective view of a detergent box loaded on a top plate according to the present invention, and FIG. 5 is a perspective view of a cover frame installed on a top plate according to the present invention.

[0040] Referring to FIG. 3 and FIG. 4, an opening 16a is formed at the top plate 16. The detergent box 24 is loaded on the opening 16a to be caught on a hanging means. In this case, the hanging means is a hook for example.

[0041] Hooks 25a are provided to the detergent box 24 to protrude from lateral sides  
5 of the detergent box 24. A bent part 17b bent downward is provided to an inside of the opening 16a, and holes 17a are formed at the bent part 17b to have the hooks 25a inserted therein.

[0042] The hooks 25a are formed at front and rear sides of the detergent box 24, and the holes 17a are formed to correspond to the hooks 25, respectively. Once the hooks 25a are  
10 coupled to the holes 17, respectively, the detergent box 24 is securely fixed to the opening 16a.

[0043] Meanwhile, the detergent box 24 is inserted to lie under the opening 16a. In doing so, the hooks 25 are inserted in the holes 17a to be fixed thereto.

[0044] The hooks 25a formed at the detergent box 24, as shown in FIG. 4, are inserted in the holes 17a formed at the bent part 17b, respectively. Moreover, the bent part  
15 17b reinforces rigidity of a neighbor part 16 of the opening 16a.

[0045] Meanwhile, the cover frame 40 is provided to the topside of the detergent box 24. And, the cover 30 is rotatably installed at one side of the cover frame 40. The cover frame 40 is loaded on the neighbor part 16b of the opening 16a. Screws 50 are then screwed in the cover frame 40 to fix the cover frame 40 to the detergent box 24.

20 [0046] Holes, in which the screws 50 are respectively locked, are explained as follows.

[0047] Referring to FIG. 3, first bosses 25c having first holes 25b inside protrude upward from front and rear sides of the detergent box 24, respectively, and second bosses 41b having second holes 41a inside protrude downward from the cover frame 40 to correspond to



the first bosses 25c, respectively.

[0048] One ends of the second bosses 41b are inserted in the first holes 25, respectively, whereby the holes 41a and 25b coincide with each other with ease. Each of the screws 50 penetrates the corresponding holes 41a and 25b to be locked. Hence, the cover  
5 frame 40 and the detergent box 24 are more easily fixed to the neighbor part 16 of the opening 16.

[0049] FIG. 6 is a cross-sectional view of first and second bosses in FIG. 3.

[0050] Referring to FIG. 6, a diameter of an upper inner circumference 25e of each of the first holes 25b is greater than that of a lower inner circumference of the corresponding  
10 first hole 25b. Hence, one end of the corresponding second boss 41b is inserted in the upper inner circumference of the corresponding first hole 25b, and the corresponding screw 50 is screwed into the lower inner circumference of the corresponding first hole 25b. Moreover, a diameter of an inner circumference 41e of the second boss 41b is greater than that of the screw 50.

15 [0051] Namely, interior screws coupled to the screws 50 are formed on the lower inner circumferences 25 of the first holes 25b, respectively, and the screws 50 are coupled to the interior screws, respectively. In doing so, the neighbor part 16b of the opening 16a is strongly clamped between the cover frame 40 and the hooks 25a of the detergent box 24. Namely, the detergent box 24 and the cover frame 40 clamp the top plate 16 to be fixed  
20 thereto.

[0052] Accordingly, the washing machine according to the present invention has the following advantages or effects.

[0053] First of all, less efforts are made to alignment between the holes of the detergent box and cover frame. Namely, while the hooks of the detergent box are caught on

the top plate, the first bosses are inserted in the second bosses. The screws are then coupled to fix the detergent box to the top plate simply.

[0054] Secondly, the top plate is clamped between the detergent box and the cover frame by the screw coupling, the detergent box is more securely fixed to the top plate.

5 [0055] Thirdly, the bent part having the holes for the hooks reinforces the support structure for fixing the detergent box.

[0056] It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover such modifications and  
10 variations, provided they come within the scope of the appended claims and their equivalents.

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